

# Setting Up Your Development Environment

## Principles of Computing

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## 1 macOS

1. Open the Terminal .app application by searching with `⌘ + Space`.<sup>1,2</sup>
2. Install Homebrew by running the following command in the terminal and following the instructions (this may take several minutes).

```
/bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"
```

(a) *Refresh your shell* by performing *either one* of the following:

- `⌘ + W` to close the window. `⌘ + N` to open a new window.
- `⌘ + Q` to quit. Reopen the application as in [step 1](#).

3. Install Python by running `brew install python@3.12`.

(a) Once installed, *refresh your shell* as in [step 2\(a\)](#).

(b) Run `python3 --version` in the terminal.

(c) You should see the message `Python 3.12.4` in the terminal.

4. Install VSCodium by running `brew install --cask vscodium`.

(a) Open VSCodium by performing *either one* of the following:

- Run `codium` in the terminal.
- Press `⌘ + Space` to search with Spotlight.

(b) Press `⌘ + ⇧ + X` to open the Extensions side panel on the left.<sup>3</sup>

(c) Search for the “Jupyter” extension and install it.<sup>4</sup>

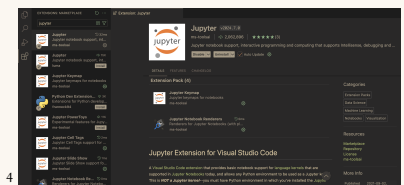
(d) Press `⌘ + ⇧ + P` to explore the *command palette*. You can try creating a new *Jupyter notebook*.<sup>5</sup>

(e) Press `⌘ + ⇧ + `` to open a VSCodium terminal and explore.<sup>6</sup>

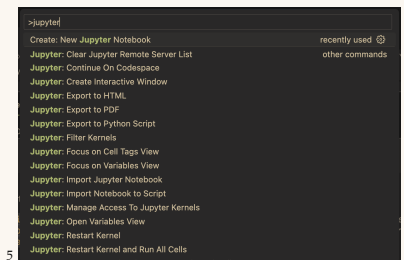
<sup>1</sup> `⌘` = command

<sup>2</sup> This application is called Spotlight.

<sup>3</sup> `⇧` = shift



<sup>4</sup>



<sup>5</sup>

<sup>6</sup> `⌘` = control

## 2 Linux

You should be able to follow the instructions for [section 1](#) pretty closely, though your keyboard shortcuts will look different and your package manager will not be Homebrew (this will depend on your Linux distribution). For more help with Linux, please see the instructor.

1. Open a terminal window.<sup>1</sup>
2. You can check to see if Python 3.12 is already installed by running `python3 --version` and checking the output.<sup>2</sup> If it's not already installed, install it using your Linux distribution's package manager.

- Arch Linux: `sudo pacman -S python`
- Ubuntu: `sudo apt-get install python`
- Linux Mint: `sudo apt-get install python`
- Fedora: `sudo dnf upgrade --refresh` and then run `sudo dnf install python`

3. Install and set up VSCode using your package manager or by downloading a binary from <https://vscodium.com/>.

- (a) • Arch Linux: `yay -S vscodium-bin`
- Ubuntu / Linux Mint / Fedora:

```
wget -q0 - https://gitlab.com/paulcarroty/vscodium-deb-rpm-repo/raw/master/pub.gpg \
| gpg --dearmor \
| sudo dd of=/usr/share/keyrings/vscodium-archive-keyring.gpg
```

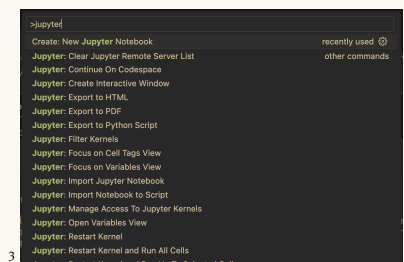
```
echo 'deb [ signed-by=/usr/share/keyrings/vscodium-archive-keyring.gpg ] \
https://download.vscodium.com/debs vscodium main' \
| sudo tee /etc/apt/sources.list.d/vscodium.list
```

```
sudo apt update && sudo apt install codium
```

- (b) Open VSCode by running `codium` in the terminal.
- (c) In the Extensions tab, search for and install “Jupyter”.
- (d) Press `ctrl + shift + P` to explore the *command palette*. You can try creating a new *Jupyter notebook*.<sup>3</sup>
- (e) Press `ctrl + shift + `` to open a new *terminal window* and explore.

<sup>1</sup> How this is done depends on your Linux distribution and choice of terminal emulator; you can try `ctrl + alt + T`.

<sup>2</sup> A version of Python is probably already installed with your distribution, but it may be older than version 3.12.



### 3 Windows 10/11

The instructions in [section 1](#) and [section 2](#) will be largely inapplicable. For more detailed help with Windows, please see the instructor or TAs.

#### Option 1: Windows Subsystem for Linux

1. Open a PowerShell terminal with *administrator* privileges<sup>1</sup>
2. Run `wsl --install` to install the Windows Subsystem for Linux.<sup>2</sup>
3. Run `sudo apt update` and then `sudo apt install python` to install Python.
4. Install VSCode by following [step 2 below](#) or [step 3\(a\) in page 2](#).<sup>3</sup>

#### Option 2: Installation Wizards

1. Install Python as follows.
  - (a) Go to <https://www.python.org/downloads/release/python-3125/> and download the appropriate version of Python for your system.<sup>4</sup>
  - (b) Open the installer, check the “Add Python” and “Admin” boxes.
  - (c) Proceed; check to disable the “path length limit” if prompted.
2. Install and set up VSCode as follows.
  - (a) View releases at <https://github.com/VSCodium/vscodium/releases>.
  - (b) Download the installer from <https://github.com/VSCodium/vscodium/releases/download/1.92.2.24228/VSCodium-x64-1.92.2.24228.msi>.
  - (c) Open the installer and proceed through the installation wizard.
3. Install Git as follows.
  - (a) Download the Git installer from <https://github.com/git-for-windows/git/releases/download/v2.46.0.windows.1/Git-2.46.0-64-bit.exe>
  - (b) Open the installer and proceed through the installation wizard.

#### VSCodium Setup

1. Set up your *shell* in VSCodium.<sup>5</sup>
  - (a) Open a new VSCodium terminal with `ctrl + shift + ``.
  - (b) Verify that your shell is set to either `bash` or `git bash`.<sup>6,7</sup>
2. Install Jupyter.
  - (a) Press `ctrl + shift + X` to open the Extensions panel on the left.
  - (b) Search for and install the “Jupyter” extension.
  - (c) Press `ctrl + shift + P` to explore the *command palette*. You can try creating a new *Jupyter notebook*.<sup>8</sup>

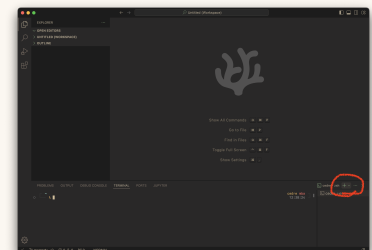
<sup>1</sup> Right click on the PowerShell application and click “Run as administrator.”

<sup>2</sup> This installs a version of *Ubuntu Linux*. Before running this command, you can run `wsl --list --online` to see a list of available distributions. You can install your preferred distribution with the command `wsl --install -d mydistro`.

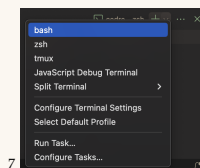
<sup>3</sup> Follow the Ubuntu instructions if you used the default Linux distribution.

<sup>4</sup> This will most likely be the one that reads “Windows installer (64-bit),” which will download an installer with the filename `Python-3.12.5-amd64.exe`.

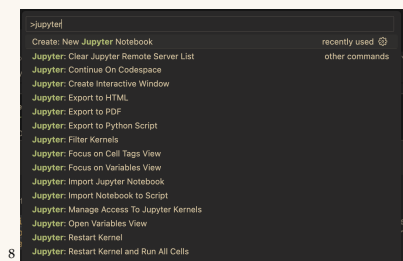
<sup>5</sup> A *shell* is the process that interprets and runs commands in a terminal. Windows comes with the PowerShell by default, but we will be using `bash` or `zsh` this semester (these two are interchangeable for our purposes).



6



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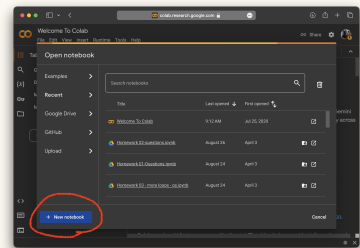
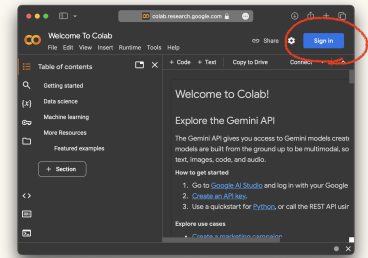
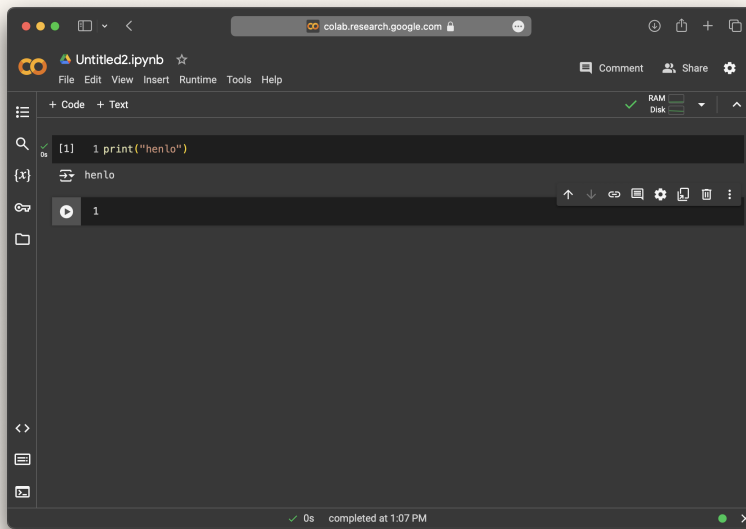


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## 4 Google Colab

This is only recommended as a *last resort* if the other options are unavailable to you. This will require a Google account and a working internet connection.

1. Go to <https://colab.research.google.com>.
2. Click the blue button at the top right<sup>1</sup> and sign in with your preferred Google account (e.g., you can use your Notre Dame email, which will prompt you to sign in through Okta).
3. You should now be prompted to create a new notebook.<sup>2</sup> Once created, your screen should look something like the screen below.



4. You can now begin exploring Jupyter notebooks with Python. You can download your notebooks using the menubar at the top.